CLAIMS:

1. A multichannel optical wavelength division multiplexed (WDM) transmission system for connecting between a multiplexer and a demultiplexer, the system comprising a plurality of serial spans extending between the multiplexer and the demultiplexer, wherein a first span is arranged to be connected to the multiplexer and each span comprises a length of optical transmission fibre, a dispersion compensating module (DCM), and an optical amplifier, the properties of the DCM being selected to suppress four-wave mixing rather than to provide complete chromatic dispersion compensation of the respective span, and wherein located immediately following a last span and connected thereto and preceding the demultiplexer for connection thereto is a further DCM having properties selected to substantially complete the chromatic dispersion compensation over the total length of the spans.

2. A transmission system according to claim 1 wherein the optical amplifier in each serial span is of a two-stage design with the DCM placed between the two amplifier stages.

3. A transmission system according to claim 1 wherein each DCM and the further DCM comprises a length of dispersion compensating fibre (DCF).

4. A transmission system according to claim 3 wherein the dispersion value of the DCFs is fixed and the length of each DCF is selected to suppress four-wave mixing or to complete the dispersion compensation as the case may be.

5. A transmission system according to claim 4 wherein the DCF in each serial span is of substantially equal length.

6. A transmission system according to claim 3 wherein an optical amplifier is interposed along the length of dispersion compensating fibre which serves as the further DCM.

7. A transmission system according to claim 1 wherein the dispersion value of the DCMs is fixed and the characteristics of each DCM are selected to suppress four-wave mixing or to complete the dispersion compensation as the case may be.

8. A transmission system according to claim 1, wherein there is a high number of channels packed extremely closely together.

9. A transmission system according to claim 8, wherein there are 400-2000 channels at a spacing of 5-10 GHz.

10. A transmission system according to claim 1 wherein the DCM in each span and the further DCM comprises a fibre Bragg grating.

11. A transmission system according to claim 1 wherein at least one span contains a channel add-drop node.

12. A transmission system according to claim 1 wherein an optical post-amplifier immediately follows the multiplexer and an optical pre-amplifier immediately precedes the demultiplexer.

13. A multichannel optical wavelength division multiplexed (WDM) transmission network comprising a plurality of serial spans forming a link between at least two nodes of the network, wherein each serial span comprises a length of optical transmission fibre, a dispersion compensating module (DCM), and an optical amplifier, at least one span containing a channel add-drop node, the properties of the DCM being selected to suppress four-wave mixing rather than to provide complete chromatic dispersion compensation of the respective span, and wherein a region immediately following the last span in the link comprises a DCM having properties selected to substantially complete the chromatic dispersion compensation over the total length of the link.

14. A method of compensating for chromatic dispersion and four-wave mixing in a multichannel optical wavelength division multiplexed (WDM) transmission system comprising a plurality of serial spans, the method comprising deliberately compensating in each span only partially for the chromatic dispersion introduced in that span such that four-wave mixing is reduced, and providing a final compensating step at the end of the spans in which the cumulative chromatic dispersion introduced by all the spans is substantially completely compensated for.